

generation consists of two spore-bearing phases, the attached sporogenous filaments of the cystocarp and the free tetrasporic plant, Dr. Fritsch accepts the view of Dr. I. F. Lewis that the first of these represents an intercalated antithetic phase, while the second represents a phase strictly homologous with the sexual plant.

MARSHALL A. HOWE

Hybrid Origin of *Oenothera Lamarckiana**

In this paper Davis reaches an approximate conclusion on the old question as to whether *Oenothera Lamarckiana* is of hybrid origin. The parents used were *O. franciscana* from California and *O. biennis* from Holland, which he assumes may have met in England, from where he believes de Vries's *Lamarckiana* came. The form obtained resembles *Lamarckiana* rather closely, but the assumption of the possibility of a cross between species native to regions as far apart as California and Holland makes the hybrid origin of *Lamarckiana* seem less convincing than if the assumed parents were found growing in closer proximity.

Davis calls his form *O. neo-Lamarckiana*. It is now in the fourth generation from the original cross and was derived from a single plant selfed in the F_2 . From the "most promising" F_3 , 549 offspring lived to be set out into the garden. Of these 198 resembled *Lamarckiana* de Vries, while the other 351 suggested *franciscana*. The author recognizes some variation among the neo-Lamarckiana plants, but he says "the best plants are so close to the *Lamarckiana* of de Vries that I can only distinguish them by small plus or minus expressions of a few characters." Davis does not state whether all the observed variations of his *Oenothera* fall within the range of variability for de Vries's *Lamarckiana*.

Davis tests the breeding behavior of *O. neo-Lamarckiana* with reference to the production of twin-hybrids and the throwing of mutants, which are the most important characters of the true *Lamarckiana*. He obtains twin-hybrids, but it is perhaps not at all established that the twin-hybrids of de Vries or Davis are

* Davis, B. M. *Oenothera Neo-Lamarckiana*, Hybrid of *O. Franciscana* Bartlett \times *O. Biennis* Linnaeus. Am. Naturalist 50, 688-696, 1916.

distinct or easily separable forms and not members of a fluctuating series.

O. Lamarckiana of de Vries has 26-46 per cent. fertile seed and throws only a few mutants. Davis's *neo-Lamarckiana*, on the other hand, was highly fertile (87 per cent.), and gave a large number of "mutants," almost twice as many as plants resembling the parent. Davis believes that the reduction of the fertility of *neo-Lamarckiana* to that of *Lamarckiana* might readily result in the production of fewer mutants, thus paralleling the condition found among the true *Lamarckiana* offspring.

There is, however, no question but that Davis has produced a form which morphologically closely resembles de Vries's *Lamarckiana*.

H. M. BOAS

Mechanism of Tumor Growth in Crown Gall*

In attempting to arrive at an explanation of the behavior of the host cells in the formation of crown gall, Smith comes to the conclusion that while the ultimate cause of cell proliferation is the organism *Bacterium tumefaciens*, the proximate cause must be the release within the cells of the host, by the bacterium, of one or more products of its metabolism.

On an artificial medium consisting of agar, water, calcium carbonate, grape sugar and peptone, *Bact. tumefaciens* produces chiefly ammonia and alcohol. With this fact as a clue Smith subjected plants to the action of various ammonia compounds, the chief methods being to inject the hollow stem of the castor bean plant, and young tomato fruits, with variously diluted solutions of the compounds and to expose the leaves of cauliflower plants to the fumes of the ammonia compounds, or to paint the solutions directly on the leaf.

In practically all cases striking proliferations occurred, the internal structure and outward appearance of which was identical with early stages of crown gall as produced by *Bact. tumefaciens*. Subsequent experiments demonstrated that this action is not restricted to ammonia compounds, but that it is characteristic

* Smith, Erwin F. Mechanism of Tumor Growth in Crown gall. Journ. Agric. Research, 8, 165-186 + 62 pls. 1917;